AVIATION

The Oldest American Aeronautical Magazine

SEPTEMBER 8, 1924 Issued Weekly PRICE 10 CENTS

Beautiful Niagara Falls

VOLUME XVII

NUMBER 10

SPECIAL FEATURES

THE FUTURE MARKET FOR AIRPLANES

FIRST AIRPLANE RADIO BROADCASTING

NAPIER CUB 1000 HP. ENGINE DESCRIBED

AIR MAIL SHOWS EXCELLENT JULY PERFORMANCE

GARDNER PUBLISHING CO., INC.

HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

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SEPTEMBER 8, 1924

AVIATION

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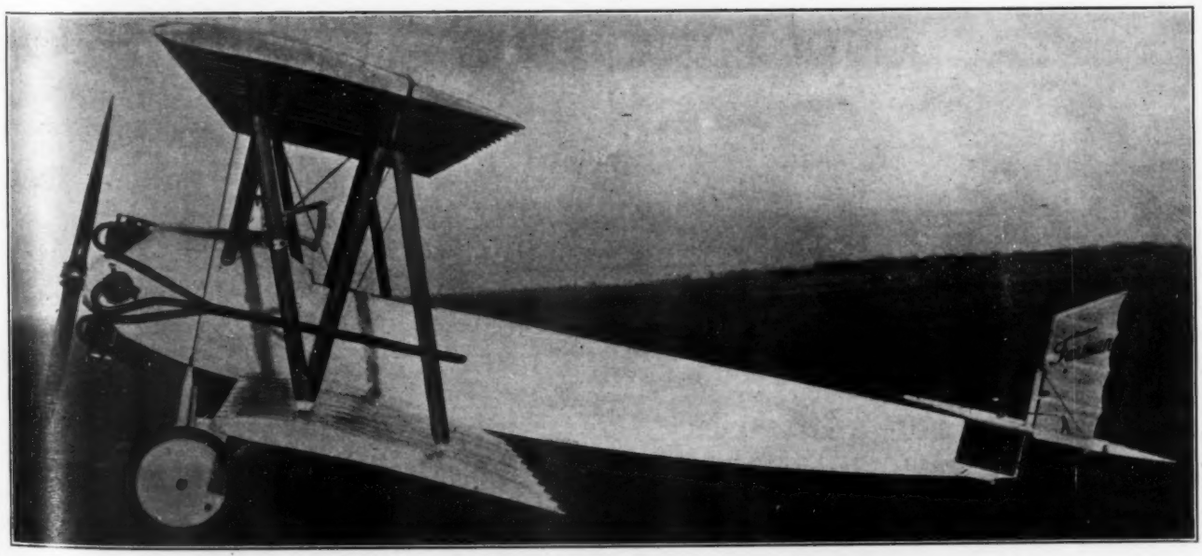
FARMAN

SPORT PLANES



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VOL. XVII SEPTEMBER 8, 1924 No. 10

The Round the World Triumph

BY the time this issue of AVIATION reaches our readers Lieutenant Smith and his command will be on the last hop of their long journey. Many great accomplishments adorn the pages of American aeronautical history. As we look over the list containing so many "first flights" they all seem to shrink in magnitude when placed beside the trip around the world. The longest trip possible for inhabitants of this globe has always had its peculiar appeal since the days of Magellan. Now the aerial voyage has been made and all that we can think about the trip is tinged with pardonable pride.

Praise has come from the entire world, and AVIATION joins the chorus with its most sincere alleluias. Some who have remained in the background should also be brought before the curtain. The officers who planned the flight, selected the planes, picked the personnel, mapped the route, and organized the replacement and refueling crews should receive complimentary recognition at this time. The officers of both the Army and Navy who have so industriously looked after the advance parties, the arrival and departure of our fliers should have a place in the group receiving the general applause. And of course the builders of the airplanes and accessories naturally should be the recipients of compliments. As was expected, the casualties to a part of the expedition were the unlucky breaks that made the average performance one that would spell success. Therefore to Major Martin and Lieutenant Wade should go the very disappointing role of enabling factors toward success. Then the officers who acted as mechanics, Lieutenants Arnold and Harding, have accomplished such extraordinary feats of repair, overhaul and successful performance that they occupy seats right alongside the pilots in the welcoming congratulations.

To the pilots, Lieutenants Smith and Nelson, little more praise could come than has already been given. Their courage, determination, skill and endurance will always be an example for Air Service officers. It is victories of this sort that go to make up the *esprit de corps* of a service. They have not faltered at any point, they have not only lived up to the traditions of the Air Service, they have created them. In the world wide rejoicing AVIATION joins, with every bit of pride that should elate every American at this time.

Flying Officers to Command

AFTER several weeks of omission of discussion of the Suggested National Air Policy, it is once more brought up for comment. The particular subject to be considered is the suggestion that there be "An experienced staff of flying officers at the head of all government air defense services."

In no way should this be construed as a reflection or a suggestive intimation as to the ability of the present staff officers of our Air Services. In all new military or naval work, particularly where large problems require experienced executive control and where the active work must necessarily be done by young officers, time only can adjust the matter of leadership. Until officers who have had wide flying experience have acquired age and the rank that comes with age, the present plan of having officers with limited flying experience in control is the only sensible procedure to follow. Even now, the judgment of the experienced flying officers is more and more in evidence in all undertakings. When complete control can be delegated to these especially trained men, there is no question in the minds of everyone that conditions will materially improve.

There has been a very marked tendency in both services to approximate this favorable condition and as flying officers with sufficient rank become available, they will undoubtedly be placed in responsible staff positions. The foreign air forces are more fortunate than ours in this respect. There, officers with distinguished flying records are in command and they speak from the flier's point of view. They make the men to whom they give orders feel that their superiors are leaders in the air rather than directors from ground positions. This part of the National Air Policy can be left to work itsself out naturally providing the fundamental soundness of the principle is recognized by all concerned.

The Dayton Races

IT is very fortunate that those in charge of the Dayton air meet have decided to discontinue the publicity regarding international entrants for the Pulitzer Race. To have done so would have been a great mistake as it has been a well known fact that it was extremely doubtful that any of the French constructors would care to risk their machines this year.

Last year, AVIATION published hopeful rumors about international entries. This year it decided to rely on direct information which has been more accurate in some ways than the impression created by some of the official announcements. Once misinformed, twice shy.

The Future Market for Airplanes

Private Planes Held to Offer the Best Prospects

By EDWARD P. WARNER

Professor of Aeronautics, Massachusetts Institute of Technology

The violent deflation which has succeeded the forced development of the aircraft industry during the war has been a world-wide phenomenon. The problem of the sudden annihilation of the demand for aircraft has been met in different ways by different countries, but all manufacturers, of whatever nationality and whatever the measures that they may have taken for meeting the immediate financial emergency, have been busily engaged in endeavoring to forecast the future. Everywhere there has been a search for new markets. Everywhere there has been profound and anxious speculation on the probable future importance of markets already existent in some degree.

Military Demand

First among the possible markets for airplanes in any country, under present conditions, are the army and navy, or the independent air force where one exists. They will continue to buy, but in quantities unlikely materially to increase. Purchases for military purposes may even fall off in number as the tension among the European states decreases, and will be certain to do so if a conference for the limitation of aerial armaments should be called and lead to definite results.

If there were to be no other market than the military one, it would be impossible that the industry be maintained at its present status without a subsidy of some sort, either avowed or veiled and taking the form of orders given to small manufacturers at prices noticeably higher than those for which the same goods could be obtained elsewhere. There are now, in all countries, far too many companies producing aircraft, and producing them in quantities too small, to permit of anything approaching the economy that could be realized with a greater unification of facilities.

If it were to be conceded that no new opportunities for the disposal of aircraft are likely to open up in the future, and that the Government's only objective in making purchases is to obtain a very moderate number of machines (a number, in the United States, presumably about equal to that now bought for the services) of the best possible quality and at the lowest possible price, then the weaker and smaller builders might well retire from the field at once, finding it practically impossible to take from their more powerful rivals an amount of business sufficient to pay for the necessary engineering and administrative organization.

The airplane, to be sure, lends itself to small-scale production, much better than does the automobile, for example, but the advantages of the airplane in that respect are steadily being lessened as wood gives way to metal, and even now it is hopeless for the factory that builds six machines a year to seek to compete on equal terms with the factory that builds 300.

Insuring Large Production

These tentative hypotheses are not, however, altogether fair ones. Small Government orders in time of peace are placed with the possible need for placing very large ones when speedy production is paramount to all other requirements, and economy is not by any means the only guiding thought in their allocation. Large production is best insured by having a number of companies ready to build, and the smaller factories must therefore be kept alive even at the cost of some wastefulness in normal times. Their potential usefulness in emergency demands their survival, and those which existed during the war have an additional claim on governmental support, for after the armistice the effort was naturally made to spread orders out thinly enough to afford at least a scanty sustenance to all the companies engaged primarily in aircraft work, instead of concentrating purchases and dooming the neglected builders to early extinction.

Continuance of present practices in the placing of orders, still neglecting the possibility of selling airplanes to other buyers than one's own Government, is unlikely to prevent a still further decrease in the number of active manufacturers and a growing domination of the field by a few large companies. There seems to be no way of avoiding such an effect unless appropriations for the purchase of new equipment be either increased or distributed so evenly among the competing firms that all alike will be reduced to a condition of penury, the shops too small and the sums available for the employment of technical staffs too limited to permit either of the satisfactory completion in any one factory of a really big job involving radically new problems in design or construction or of the initiation of such research programs as are necessary if the art of aircraft construction is to advance.

The assumption has so far been made that airplanes can be sold only to the Government, but that, of course, is not even now strictly true, and other markets should become increasingly important in the future. Broadly speaking, they may be divided into two classes of purchasers, the air transport lines and private individuals.

Limited Air Transport Demand

Some at least among those who have faith in the future existence of a self-sustaining industry, independent of military demand, base their optimism on the prospect of a growing use of the airplane and airship for the transport of passengers and express. That such use will increase, and that the number of lines operating and the frequency of their services will be increased correspondingly, is as sure as anything can be, and a certain number of airplanes will be required as new routes are opened, as well as for continual replacements. It does not necessarily follow, however, that the need for new machines for such purposes will be adequate to the maintenance in normal health of even such an industry as is now in existence, to say nothing of such a one as it may be considered necessary to build up, by Government subsidy or otherwise, to insure the national safety in case no action leading to a limitation of aerial armaments is taken by international agreements.

It is not difficult to make at least a rough estimate of the amount of new equipment that commercial air lines would be likely to absorb. The amount of commercial flying done in the United States, including the operations of the Air Mail but omitting those of itinerant "gypsy fliers," aggregates about 2,500,000 mi. annually. The total for European lines is some 5,000,000 mi. America can be well covered with routes, air service being supplied wherever there is apparent a real possibility of early usefulness, with a total mileage which may be estimated, with the vagueness that any such estimate must have, at from 15,000,000 to 20,000,000 a year. The higher of those figures, which is unlikely to be exceeded in the next couple of decades, may be used as a basis of further calculation.

Number of Transport Planes per Year

The rate of depreciation or obsolescence of the airplanes to be designed as some indefinite future date is almost as indeterminate as the amount of flying to be done at the same time. The life of aircraft will, however, be longer than it is today, and even now there is ample evidence that a properly maintained airplane can be flown for more than 2,000 hr. An average total distance of 300,000 mi. an airplane seems a fair assumption for a time contemporaneous with that at which American air lines will have extended their operations to the impressive scope specified in the preceding paragraph.

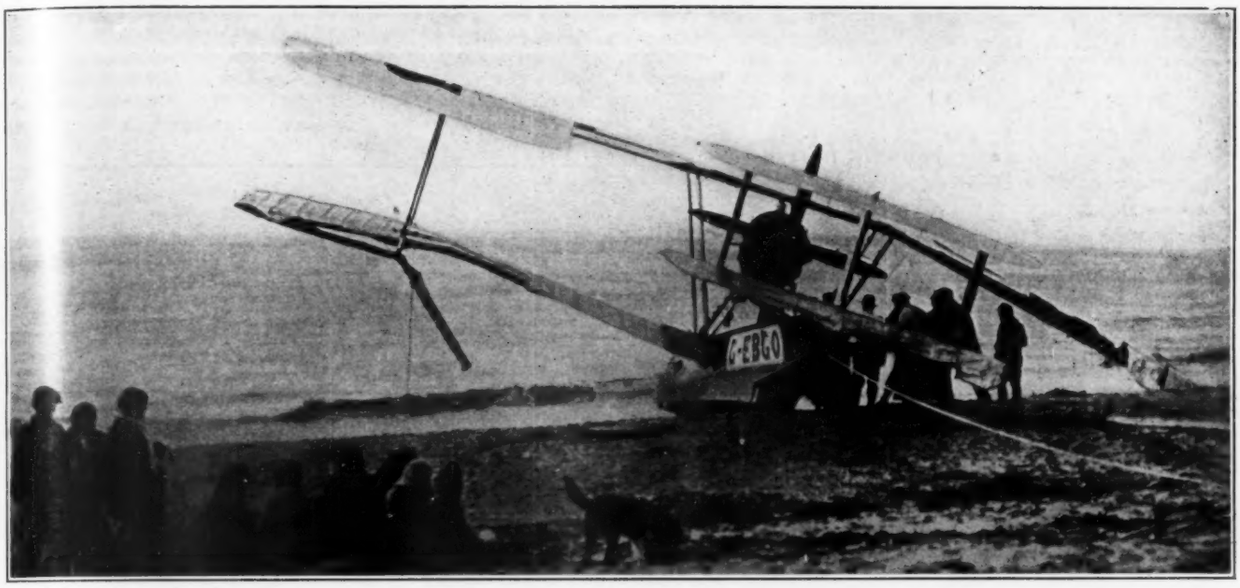
Three hundred thousand miles an airplane and 20,000,000 mi. a year indicates a demand for less than seventy new airplanes each year, an insignificant production, particularly when something approaching standardization of commercial design has been attained. That output would hardly be sufficient to keep one factory running efficiently.

There is no escape from these figures. The requirements in new equipment could only be increased by the deliberate selection of airplanes which would depreciate more rapidly, by scrapping machines still in good condition, or by increasing still further the amount of flying done. The third solution probably will not be feasible for many years, and the first two are manifestly opposed to considerations of economy and to the interest of the operating companies, although the second method has been adopted to some extent in certain European countries where the bond between commercial flying and possible military use has been kept very close.

duction of airplanes be absorbed elsewhere than in the service of commercial companies.

Future Private Use

Sale to private individuals lies almost wholly in the future, the number of such sales of new aircraft, leaving out of consideration the disposal that has been made of the Government's surplus equipment since the end of the war, having been trivial up to the present. The ultimate importance of business of that sort, as well as the rate at which the ultimate figure is approached, will depend chiefly on two factors, public psychology and the progress of aeronautical engineering in application to the special problems of an airplane for private operation. The rate of elimination of the war-time training machines sold as surplus and now hawked to and fro at prices hardly covering their value as junk, is also of some importance for the moment, for it is very hard to persuade a customer to balance quality against price to the extent of buying a new airplane when one still quite serviceable, even though admittedly inferior to the new machine in many respects can be had for one-twentieth the price. That disturbing element, however, must sooner or later disappear from the situation.



The end of a gallant effort, Major A. Stuart MacLaren's Vickers Vulture plane on the beach at Nikolski, Komandorski Island, after the wings were smashed during a forced landing in a choppy sea due to fog. The hull and Napier Lion engine were salvaged by the Canadian Coast Guard Steamer Thiepval and landed at Vancouver, British Columbia, on August 20. Major MacLaren and his flight companions, Flying Officers Plenderleith and Broom, were passengers on the rescue ship and received a tremendous welcome at Vancouver. Major MacLaren paid a tribute to the sportsmanship of the Americans in transporting to him a new plane near Rangoon, Indiaand wished our world fliers every success

Must Look Further

The conclusion that commercial operation does not offer bright prospects for aircraft constructors is, indeed, in accordance with experience in other lines of transport. Shipping presents rather an unusual case, in that the units used are so large that standardization is very rare, for each new ship comes to the builder as a new problem. Quantity production is hardly possible, but even so, the number of yards building steel ships is small. A better parallel is found in the building of locomotives for land transport. Despite the great extent of the services offered by the railroads of the United States, practically all new locomotives, except for those used by one or two of the large railroads which build their own, issue from the shops of two companies. There are several times more constructors seeking at the present time to occupy an important place in the airplane industry than have any expectation of doing so in the building of that particular form of railroad equipment.

This is not necessarily a counsel of despair, but it is a warning against confusing things which should not be confused and against placing trust for the future development of the aircraft industry in an illusory market. If any considerable number of companies are to build airplanes and if Government orders are not to be raised very much above their present number, it is necessary that a large part of the pro-

Mass psychology is not understood sufficiently to permit of any estimation of the time when the present widespread prejudice against flying will begin to wane. In a certain sense the process has already started, and both the usefulness of the airplane in saving time and the pleasures of air travel are gaining a growing appreciation. That change of attitude of mind is showing itself first in a growing willingness to use the facilities of air transport companies but it is likely to be followed by a spreading out of private ownership of aircraft by the wealthy, put to such use as a few pioneers have already made of seaplanes for commuting between New York and various shore resorts.

The problem of the engineer is largely one of simplifying flying. Although the handling of an airplane under normal conditions is even now a very easy matter, it still requires a skill and judgment which can only be insured by careful and prolonged training and by constant practice. The wealthy who commute by air will probably employ professional pilots, but the airplane for touring will not come into very extended use until the further study of aerodynamics leads to the

elimination of those hazards which now prove most discouraging to the amateur who would like to fly if he could learn and practice that art with the same ease as he learned to drive an automobile. Foremost among the outstanding problems is the elimination of the danger of flying at too low a speed, with resultant stalling and sudden dropping into a spin. Great progress has already been made in the study of the nature of spinning and the possible means of preventing that very complex and often undesirable maneuver, but there is much yet to be done in the same direction, in order that the control of an airplane may be made not only as simple but as constant in its effects as that of an automobile, and that without sacrifice of performance. The difficulty of flying lies not in the inherent complexity of the operation, but in the possibility of getting into a position where the machine may fail to respond to the ordinary use of the controls.

Problems Will Be Met

There can be little doubt that the technical problems will be solved and that the public skepticism on the subject of the airplane for every day use will be overcome, and the private purchase of airplanes will then almost automatically become an important source of revenue to those who build the craft. While no one ventures to proclaim a future for the airplane presenting any direct parallel to the phenomenal expansion of the automobile industry, there should be enough business, when private flying gets well under way to support an industry of fair size without any reference to army and navy orders. In that lies the chief hope of the future, and the interest of the manufacturer, if he is far-sighted should turn toward the small two or three passenger airplane even more than toward the large commercial machine.

Sale for private use is likely to accelerate rather than to retard that process of concentration of construction in the hands of a few companies which has already been predicted. The small airplane must be a standardized product, resembling automobiles in that respect more than, for example, motor boats, and quantity production will be required for economy. Unless the sales become very large, therefore, larger than one dares to expect, most of the business will be done by a few large companies, just as in the automobile industry, despite its vast and growing total production, the number of factories has almost continuously decreased since the first stages of the automobile boom.

The Small Operators

Editor, AVIATION:—

Everyone's grasp of aviation development is necessarily limited, due to lack of intimate contact with a large number of aircraft users. Our connections are likewise restricted, and our acquaintance is only with a small portion of those who constitute the bulk of fliers and who are the basis of commercial aviation as we know it today.

Our correspondence however is to some extent illuminating, in that most of the letters of inquiry that we receive are full of thoughts, plans, and opinions regarding the future of aviation, and are somewhat indicative of the general trend of thought of the small operator.

Probably a condensed version of these ideas would run something like this:

They want better airplanes, slower landing speeds, higher cruising speeds, greater ceiling, more passenger room, better and more economical motors of greater power. Most of them are unable to pay for the perfect airplane they want, but are going to make a fortune tomorrow or the next day and will get it then if it is to be had. When they fail to cash in on their expectations, most of them insist that within a month or so they will knock the world cold, at least that part of it known as Main Street, and will be after the new ship then. Discouragement is a word they never heard and will not listen to. Most of their letter heads inform you that they should be considered an aerial transportation company and the contents of their letters inform one that they are just getting started by joy riding passengers and that next year they intend to run a full fledged air line between Sqweedunk and Oskaloosa. They let you know that they consider themselves the best pilots in the world (as a matter of fact they are), and tell you about how they herded the old Jennie out of that ball park down in Oklahoma, or about the time they got into the potato patch in Tennessee. They admit they like the appearance and performance of your ship, but don't you think that you could increase the speed by washing out the angle of incidence, or how about a degree or so of decalage?

They are gluttons for reading matter regarding any phase of aviation, and read every word of your magazine including all the ads. They are convinced that next year or the one after will see them at the head of a big aviation field where they rent hangars and give service to all the other enthusiasts in the community and know that they are the logical organization to handle your ship in their territory.

At first analysis it would seem as if they are very egotistical. They are not. It is just a case of intense interest, and enthusiasm, and a spirit of fighting, flying courage, that more than airplanes, more than scientific research, and more than

One of three Fokker Planes with 450 hp. Napier Lion Engine in which Major Pedro Zanni, Argentine Pilot, is attemping a Round the World Flight

tangible organizations will be responsible for the advancement of aviation.

Each year these unheard of and unheard barnstormers and small operators, are carrying thousands of passengers, training hundreds of students and interesting hundreds of thousands in the airplane as a mode of travel. They are building up a reservoir of enthusiasm which will some day break its dam and then aerial transportation will be here with a rush. They, we believe, more than any other group interested in flying, are deserving of consideration by your magazine, and remember that every word printed in it is taken to be gospel by them.

Your small plane section if possible should be enlarged by an additional elementary course in design and construction. I mean it should enter a little more fully into the why of things. Lots of present day fliers never saw ground school.

As to what they are using planes for: It varies from bootlegging to advertising, but the mainstay is passenger work.

Our sales are of course small in comparison to the sale of surplus government ships, and due to the higher price are perhaps not indicative of those to the average flier. Our buyers are either commercial operators who have been successful in the past and want a better ship with increased earning capacity, or in some cases men of means who want a good ship regardless of price.

Some of our late sales are as follows, including the use to which the ship is being put:

The Lenoir Aero Co., Lenoir, N. C.; passenger work and photography.

Tex LaGrone, Kansas City, Mo.; passenger work and motor sales, flying for the Clester Motor Co., Ford agents.

Thos. Grieve, Zanesville, Ohio; advertising and pleasure advertising Gold Bond Bread, for the Grieve Baking Company.

Eddie Hamilton, Detroit, Mich.; passenger work and photography.

The Indian Lake Aviation Co., Russels Point, Ohio; passenger work.

Indianapolis Aviation Co.; photography.

THE ADVANCE AIRCRAFT COMPANY,
By E. JUNKIN

August 19, 1924
Troy, Ohio

The First Airplane Radio Broadcasting

The airplane will in the future become an important link in the art of radio broadcasting. Through the cooperative experiments made by The Radio Corporation of America, Maj. William N. Hensley, Commanding Officer of Mitchel Field, Long Island, and AVIATION, *the practicability of using airplane radio transmitters to broadcast in connection with the powerful radio stations, was demonstrated on Aug. 14, in New York City, after a series of tests covering a period of two months. Major Hensley flew over New York City and held a two-way conversation with Maj. Lester D. Gardner, publisher of* AVIATION, *who was talking into a microphone located in Central Park. The conversation from ground and air was sent out to thousands of listeners by Station WJZ, at New York.*

The account of this interesting development as published in the New York Times, *gives a clear description of the test. The next use of this method of broadcasting will be in greeting the Prince of Wales when he arrives in New York, and also in greeting the Round the World Fliers when they reach New York City.*—EDITOR.

Picking the hour of 7 p. m., when radio fans, as a rule, are close to their receiving sets, Station WJZ of the Radio Corporation of America yesterday repeated its experiment of the day before of talking by radio between the earth and an airplane flying over the city and broadcasting the results.

An observer in an airplane from Mitchel Field flying a mile above New York City talked to radio experimenters on the ground and they in turn talked to him, the complete conversation being broadcast to radio fans, who said they heard it perfectly. According to Station WJZ of the Radio Corporation of America, which conducted the tests, this has never been done before, so far as they know, in the history of radio communication. They profess to attach great importance to the results as suggesting enlarged possibilities in broadcasting.

The field station for the test was set up atop a little knoll in Central Park just west of the Mall. Antennae were strung between the trees. The apparatus in the field consisted of a superheterodyne receiver, a remote control amplifier panel and a set of batteries.

Radio signals that came from the airplane were received on the antennae, amplified on the field and sent 3 mi. by wire into the control room of Station WJZ in Aeolian Hall. There they were amplified and modified for quality and sent to the transmitter room, whence they were broadcast with 500-watt power.

Major Lester D. Gardner, Publisher of AVIATION, *at the microphone in Central Park during the two-way airplane-radio broadcasting test. Mr. Carl Dreher, right, radio engineer of the Radio Corporation of America and his assistants are shown operating the receiving and amplifying apparatus*

The results were noticeably clearer than those of the day before as far as the signals from the plane were concerned. This time the aerial microphone was handled by Maj. William M. Hensley, Commandant of Mitchel Feld. Carl Dreher, the engineer in charge for WJZ, explained that Signal Corps officers had been working all afternoon on the airplane set to eliminate extraneous noises.

Mr. Dreher said the roar that had been heard the day before had not come entirely from the motor in the plane, but that a certain amount of generator hum had been included in it. The Signal Corps engineers, he said, had eliminated a good deal of this by the use of condensers. The same apparatus that had been used the day before was set up in Central Park. Again Maj. Lester D. Gardner, editor of AVIATION, was at the ground microphone. Major Hensley's DeHaviland 4 plane was piloted by Lieutenant Connell.

The test was pronounced a complete success by the Radio Corporation people. A reporter for *The New York Times* on

the field who listened in with a headpiece for a time could plainly hear the voice of the aviator and his responses to remarks addressed to him from the ground. Outside listeners also reported they had heard the whole conversation perfectly.

One of the handicaps to perfect hearing of what was sent from the airplane came from the roar of the machine's big Liberty motors. The aviator explained this himself. His microphone was not more than ten or fifteen feet away from his motor, and the roar was transmitted with his voice.

Question and Answer Test

This time the test was carried on by means of short questions and answers exchanged between Majors Hensley and Gardner. Side remarks by each were caught up by the other in a way that graphically suggested how thoroughly observers screened on the ground could be kept in touch with everything in the four points of the compass that could be seen by a plane a mile up in the air.

It had been agreed beforehand that before answering any question from the ground Major Hensley was to count 1-2-3-4-5-6-7-8-9-10, and that before replying to the voice from the clouds, Major Gardner was to say A-B-C-D-E-F-G. This was to be done in order that each should have opportunity to do fine tuning for the other and to allow time for throwing the switch that changed broadcasting to receiving.

However, so clearly could each hear the other that both Majors often forgot to put in their precautionary signals.

After detailing the apparatus on the field and that in the airplane and explaining how they would work, Major Gardner announced that the moment for the test had arrived.

"If the airplane hears me," he said, "I wish it would now answer."

There was a moment's pause and then, shot through with the roar of the motor, the voice of the observer in the airplane could be heard.

"We are up here a mile above Central Park—gosh, I'm forgetting that 1-2-3 business," came the voice of Major Hensley at one time.

"Yes, I forget it myself; I get you so clearly," Major Gardner switched in.

It was 7:01 when Major Gardner on the ground began announcing to listeners what was going on. He told of the condition that would be observed and gave a short résumé of developments in airplane radio work.

Plane High Over Mall

"Where are you?" he asked of the vacant air. In a moment there came an answer.

"Hello, hello, hello, 1-2-3-4-5-6-7-8-9-10, Good evening, Major I get you very well. We are over the Mall in Central Park looking down on one of the greatest panoramas in the world."

"A-B-C-D-E-F-G-. We heard you very clearly indeed," Major Gardner broke in. "Will you tell us what altitude you are at and at what speed you are going through the air."

"1-2-3-4-5-6-7-8-9-10. We are about one mile up and—wait a moment—going at approximately 100 mi./hr. Lieut. S. M. Connell—C-o-n-n-e-l-l—is piloting and we are circling with the plane banked to keep as nearly over you as we can."

There followed a series of questions and answers, interrupted by:

"Wait a minute," the voice from the sky said. "I've put my foot on one of the wires that leads to the control. Just hold on a second until I reach over and fix it and then we'll go ahead."

"I can see you up there about 3000 ft. above us," said Major Gardner, introducing his next question.

"Say, Major, you're a pretty good estimator of airplane heights," interjected the aviator. "You said we were 3000 ft. up and our reading is 3,400 ft. That's coming pretty close.

"It's funny to hear a man talking from a mile high above the earth," he said. "Only a few years ago anybody would have said you were crazy if you had predicted it."

Then he launched into a brief history of aviation progress. He alluded to the dawn-to-dusk flight of Lieut. Russell Maughan and to the round-the-world flight.

"Major Hensley, Commandant of Mitchel Field," he said from the sky, "invites you all to be present when the world cruisers arrive there, probably late this month."

At this juncture Major Gardner cut off the sky talker and explained for the benefit of those who might have tuned in after the first announcement what was going on. "The unusual thing about this test is," he added, "that we cannot see the airplane. It may be headed back to Mitchel Field and out of our range. But we will try again. Now I'll go off, and if the airplane hears me, will it please resume the conversation."

Again the aviator came in.

"We want to thank you," Major Gardner broke in, "for your cooperation in this test through the courtesy of Major Hensley. We have heard everything you said and your talk on aviation was just what the people want to hear. The experiment has been highly successful and will undoubtedly lead to the broadcast reporting of events that could be described as they are happening in no other way."

A few more questions and answers, and then Major Gardner said:

"Well, it's 29 min. after 7, and President Coolidge will soon be broadcasting, so I guess we'd better stop. Will you say good-bye to the audience from the air?"

"Yes, I'm sorry our time is up," came the response. "I've got 7:31. Not wishing to compete with the President, I'll sign off from the great radio audience. We're now flying over New York at 4,000 ft. Good-bye."

H. Staples, sexton of the Episcopal Cathedral in Garden City, was waiting on the field when Major Hensley returned. He offered his congratulations.

"I heard every word you spoke," he said, "and I am proud of having the distinction of being the first to congratulate you personally. That's why I drove here." Several hundred automobiles were parked on the flying field by persons who awaited the return of Major Hensley. All had heard the broadcasting.

Tribune Comments on Test

The New York Tribune gave the following radio criticism of the test:

"WJZ stole a march on its contemporaries and supplied us with a thrill. Yes, sir, it supplied us with a thrill. It was about 7:15 when we tuned to Major Gardner, the gentleman who has kept us so well informed concerning the progress of the 'round the world flight. Mr. Gardner was in Central Park using the wire from the Mall that is used for the Goldman concerts. Flying over his head, and well into the clouds, was another major, Major Hensley, of Mitchel Field. If we understood the lower major correctly, the upper major was flying in a DeHaviland. Without a single hitch, we overheard the two men talking to each other. Major Hensley, from a point 4,000 ft. above the Mall, described the scene below him. He was using an airplane transmitter of small power which was being received from at the Mall. Here, no doubt, the speech was heavily amplified and fed in to the land wire that carried it to the modulator tubes at the WJZ studio, where it left to take to the air for a second time. Major Gardner's voice was broadcast to the radio audience and to the major in the plane by WJZ's transmitter. It was a highly instructive demonstration and it put a kick in the whole program."

Increase in Japan's Air Force

The Japanese Army reorganization program has been finally put in shape, says an Associated Press despatch dated Tokio, Aug. 27.

It is authoritatively stated that the new plan will abolish four divisions and other minor units, resulting in a saving of 18,000,000 yen. Of this saving, 13,000,000 yen will be allotted to the establishment of twelve air squadrons, equally divided between pursuit, scout and bombing squadrons, a tank corps, anti-aircraft units, motor transport, schools of chemical warfare and research and a school for non-commissioned officers.

Naval authorities have agreed to an increase of 28 squadrons and hope to secure the expansion at the regular session of the diet in December.

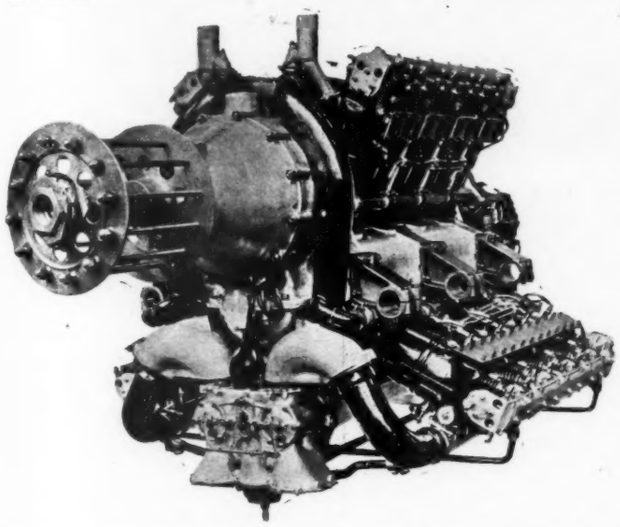
The Napier Cub 1,000 hp. Engine

The Napier Lion engine of 450 hp. is well known in this country due to its successful use on the British commercial air lines. One of these engines has now seen more than 1,000 hr. of service, first on the London-Paris route and later on the London-Cologne route. A resumé of the British Aircraft Industry given in "Flight," shows that of 53 new types of planes described, 26 have Napier engines, there being 225 per cent more Napiers than any other type. The performance, therefore, of the new 1,000 hp. Napier Cub will be watched with much interest.

Six of these engines have been ordered by the British government and successful flight tests have been conducted on the Aldershot Bomber and Avro Cub but details of the performance have been kept secret by the Air Ministry. The specifications furnished by D. Napier & Sons are as follows:

General Particulars and Dimensions

Number of Cylinders. Sixteen.
Arrangement. Four blocks of four each, 2 at 26¼ deg. to vertical; two at 26¼ deg. below horizontal.
Bore. 6¼ in.
Stroke. 7½ in.
Horsepower. Normal 1,000 hp. Compression ratio 5.3 to 1.
Direction of Rotation of Airscrew Shaft. Clockwise viewed from airscrew end.
Speed of Ditto. Reduction ratio 1 to 2.04 of crankshaft.
Ignition. Four special magnetos giving dual ignition. Clockwise rotation.
Oil Consumption 0.028 lb. approximately per b.hp. hour at full load.
Fuel Consumption. 0.48 lb. approximately per b.hp. hour at full load.
Starter. Pressure Gas System with distributing mechanism on engine.
Weight of Engine. 2,450 lb. approximately, complete with airscrew boss, carburetors, induction pipes, magnetos, starting distributor gear and pipes.
Weight per horsepower. 2.45 lb.
Length Overall to Center of Airscrew. 5 ft. 11½ in. approximately.
Width Overall. 4 ft. 9 in. approximately.
Height Overall. 5 ft. 2½ in. approximately.
Cylinders. Steel forgings machined all over. Water jackets of steel. Detachable aluminum camshaft casings, valves and valve actuating mechanism.



General view of the 1000 hp. Napier Cub engine, seen from the propeller end

Pistons. Of aluminum alloy, fitted with two gas and two scraper rings. Gudgeon pins of large diameter and hollow, floating in piston bosses and connecting rod.
Valves. Two inlet and two exhaust per cylinder, each fitted with two coil springs and operated by overhead camshafts and rocking levers driven through bevel gearing by shafts from the crankshaft. The whole of the camshaft mechanism is enclosed within a detachable oil-tight aluminum case.
Connecting Rods. Machined from special high grade steel. The master rod, coupled to the pistons of the top port block of cylinders, is formed with lugs on either side, to which are attached the short auxiliary rods for the pistons of the other three groups of cylinders. The big ends are white metal lined, anchor pins and other parts work in bushes of ample size.
Crankshaft. Machined from a solid steel forging. The four throws are in one plane, and all journal bearings and crankpins are of large diameter and bored out. The shaft is carried in five substantial roller bearings and a large plain bearing at the forward end.
Airscrew Shaft and Drive. Shaft rotates clockwise, looking at the airscrew end. It is carried on two roller bearings and fitted with a large double thrust ball bearing, to take the thrust of either a "Tractor" or "Pusher" airscrew. Reduction between airscrew and crankshaft through wide high grade alloy steel spur gears. Shaft and its gear and cover can be withdrawn from crankcase.
Crankcase and Oil Sump. Of aluminum suitably stiffened at all necessary points and having brackets on either side for attachment to the fuselage. The crankcase front end encloses the reduction gear for the airscrew shaft together with the shaft and bearings. The rear end cover contains the two scavenge oil pumps, the pressure oil pump and the drive for the camshaft, magnetos, water and oil pumps.
Water Pump. Centrifugal type, mounted to rear end of engine and running at one and one-half crankshaft speed. The spindle is fitted with a metallic packed gland and a screw-down greaser. Water is delivered through a separate outlet to each of the four cylinder blocks.
Oil Pumps. Two suction and one pressure gear pump driven at engine speed through gears. The suction pumps connected to the sump and the pressure pump taking oil from the supply tank through a suitable filter.
Magnetos and Ignition. Four special eight cylinder magnetos, rotating clockwise, mounted on platforms at the rear end of engine. Metal braided ignition cables carried in aluminum troughs. Advance and retard links and levers interconnected with throttle control.
Carburetors. Two twin carburetors are fitted. The bodies, which are of aluminum and stayed to the crankcase, are water jacketed. The gas inlet pipes to the induction on the cylinder heads are of steel and are water jacketed. Altitude control cocks are fitted and are interconnected with throttle control.
Lubrication. By pressure throughout to big ends, gudgeon pins, bearings of camshaft and forward bearing of crankshaft. The reduction gears are lubricated by oil ejected on to the teeth from a pipe connected to the crankshaft lubricating system. Valve tappets and cams are lubricated by the oil escaping from the camshaft bearings, which drains into the sump and is delivered thence to the supply tank by suction pumps. An adjustable pressure relief valve is incorporated in the system.

Engines are supplied with water pipes arranged for "Tractor" machines. Altered pipes are necessary when the engine is used as a "Pusher" type.

No Rest for Record Breakers

Editor, AVIATION:—

I enclose certain extracts from "The Non-Stop Flight Across America" by Macready which appeared in the *National Geographic Magazine* recently. I also enclose certain imaginary extracts which are self-explanatory. Perhaps you can use these to emphasize the absurdity, and what might be the tragedy, of permitting highly skilled officers to do manual, mechanical labor prior to undertaking a great test of courage and endurance.

Surely there is something wrong with the Air Service organization on the ground if officer pilots have not sufficient confidence in its personnel to rely upon it for complete preparation of equipment before flight. After reading over the imaginary statements of the Cavalry Officer and the Artillery Officer, I think you will see more clearly how foolish the Air Service looks.

Macready says: "Kelly and I expected to fly out to San Diego and rest and relax before undergoing the ordeal of the transcontinental flight. Our work was just beginning. We found that one of the requirements for a long flight is to do the immediate preliminary work yourself and get dog tired before starting. It was necessary to install a new engine, etc."

"Kelly, the mechanics and I worked during nights as well as days and on Sunday *in order to get the engine quickly installed.* After landing at Mitchel Field, L. I., it was necessary to spend approximately two days in working on the engine. We had been working in grease and dirt, without rest for a long time previous to the flight."

Suppose a cavalry officer would write:

"I found that one of the requirements for a long ride is to do all the preliminary work yourself and get dog tired before starting. It was necessary to fit a new saddle, attend to the shoeing of the animal (myself), carry the grain and hay and feed it, polish the leather, and file down the teeth of my mount. We worked during the ensuing nights, as well as days, and on Sunday, in order to get the animal properly equipped, and in proper condition. I had been working in stable dust and manure without rest for a long time previous to the ride. ...."

Or an Artillery officer: "We found that one of the requirements for a long march is to do the preliminary work yourself and get dog tired before starting. It was necessary to install new poles on the caisons, clean breech blocks, grease axles, load caisons, as well as attend to the animals. Jones, the gunners, and I worked during the ensuing few nights, as well as days, and on Sundays, in order to get the battery quickly in shape. We had been working in grease and dirt without rest for a long time previous to the march."

How long would the Army permit such lack of organization to continue?—EX-OFFICER.

Air Mail Shows Excellent July Performance

The report of Paul Henderson, 2nd Asst. Postmaster General, on the 31-day test of the through New York-San Francisco Air Mail service during July, shows a high degree of performance in the face of especially unfavorable weather conditions for night flying, and there were no accidents worthy the name. While the revenue received from Air Mail stamps was considerably less than the cost of the service, Colonel Henderson points out that it would be unfair to lay too much stress upon this until the Air Mail has had the benefit of four to six months traffic solicitation.

As far as the physical operation of the continuous New York to San Francisco service is concerned, Colonel Henderson unqualifiedly predicts its success. Whether or not the public will support the service to a degree which will warrant its continuation, he states, is an open question.

One difficulty experienced by the new service, which a more distinctive air mail stamp should remedy, was that a large number of letters intended for the Air Mail were routed by way of trains by post office and railway mail clerks.

The report pays a tribute to the "untiring, loyal, efficient service rendered" by General Superintendent Egge, Mr. Magee, lighting engineer, and by the superintendents of the Eastern and Central Divisions, Mr. Whitbeck and Mr. Colyer, and also praises the spirit and ability of the pilots.

During the 31 days of July Air Mail planes flew 173,910 mi. Over that part of the route operated at night, the weather was unusually bad. During the first 20 nights there were only 6 with clear weather straight through from Chicago to Cheyenne. The remaining 14 nights were cloudy, hazy, rainy and windy. There were frequent local storms amounting in certain instances to cloudbursts and tornadoes, and many electrical storms. Weather conditions such as these are even a greater menace to aviation than more severe rain and snow storms experienced in other seasons of the year. The very fact that these storms come up quickly and that they are severe while they last creates an unusual hazard.

Notwithstanding these storms the Air Mail was able to maintain an average of 39 hr. and 49 min. westbound, and 36 hr. and 21 min. eastbound, compared with the scheduled time of 34 hr. 45 min. westbound, and 31 hr. and 35 min. eastbound.

It is of interest to compare these averages with the best established rail schedules of 36 hr. westbound and 90 hr. eastbound.

The poorest performance westbound was made on July 18, when 55 hr. and 40 min. were consumed. As compared to the best combination of rail schedules, which is 86 hr., this shows a saving of 30 hr. and 20 min.

The poorest record eastbound was made on July 12, when 57 hr. and 39 min. were consumed. This, as compared to the best rail schedule eastbound, 90 hr., shows a saving of 32 hr. and 21 min.

Reserve officer members of the Pittsburgh Aero Club who completed this summer a two weeks refresher flying course at Langley Field, Va. They will keep in practice at Rodgers Field, the new Pittsburgh airdrome, upon its completion. Standing, L. to R.: Sec. Lt. Harry D. Teeter; First Lt. Christopher J. Evans; Sec. Lt. Robert C. Wentz; Capt. Meyer B. Horner; Sec. Lt. Arthur D. Swift; First Lt. William L. Scott; Maj. Samuel McCahill; Capt. Ewing W. Day; First Lt. Jack I. Grow; First Lt. Ralph R. Kuhn; Sec. Lt. Robert H. Hancock. Sitting, L. to R.: Capt. John R. Wright; First Lt. John C. Kelso; First Lt. Clair S. Black; Sec. Lt. Howard T. Gordon; First Lt. Louis T. Barry; First Lt. Howard B. Pearce, President of the Aero Club; Sec. Lt. Bertrand H. Smyers, Jr.; First Lt. John J. Feery; Sec. Lt. William J. Austin; First Lt. Anthony DePodesta; Sec. Lt. Alden D. Perley

Part of the delay during July was brought about by the fact that as yet there is no lighted air way into San Francisco, or New York. The lighted air way now extends only from Cleveland, Ohio, west to Rock Springs, Wyo. This resulted in delays overnight just a few miles outside of San Francisco and New York. The course from Mather Field, in the Sacramento Valley, to San Francisco is now being lighted; also the route across New Jersey into New York, so that ships arriving near New York or San Francisco early in the evening may proceed with proper lights to guide them. This should improve future performance.

Colonel Henderson points out that the mail pilots have learned to land at night on the emergency fields provided for such landings, and that as the weather interferes with safe flying they are landing on these fields and waiting for safe flying weather. This of course delays the mail but makes for safety of operation.

Memorial for U. S. World Fliers

With the near arrival of the U. S. World fliers in the United States on the last leg of their epic globe-girdling trip, the citizens of the Pacific Northwest, through the Seattle Chamber of Commerce, have requested permission from the Navy Department to erect a historic memorial shaft marking the start and finish of the Army airmen's flight at Sand Point airport.

Secretary of the Navy Wilbur wired a reply offering no objections, but suggesting that the project be taken up with the Commandant of the Thirteenth Naval District as to location and nature, to prevent interference with contemplated naval air activities at the field.

New Altitude Chambers to be Safer

Prevention of a recurrence of the accident in September, 1923, in which four men were killed, has been the object of the redesign of the altitude chambers of the Bureau of Standards, the reconstruction of which is now nearing completion. While every possible precaution has been taken to prevent explosions, it is not safe to rely on prevention alone. The altitude chambers have therefore been designed in such a way as to reduce to a minmum danger to employees and to the building in case another explosion should occur.

These altitude chambers are used for testing aircraft engines under the conditions of low air pressure and cold encountered at high altitudes. They have walls of reinforced concrete sixteen inches thick, and the doors are correspondingly strong. During the test the engine is sealed up in the room, and a large vacuum pump is used to maintain the low air pressure desired. Ammonia coils are used for lowering the temperature. All controls are placed outside the chamber and no one is inside during the test.

In the explosion last year the doors of the exploding chamber were blown outward into the laboratory. The explosion, escaping into the laboratory, blew out every window in the building, steel sash and all.

The doors to give access to the altitude chambers are so designed that they are more than able to withstand the pressure that might result from an explosion in the chamber. To limit the maximum pressure to a low figure, special large openings are provided at the rear of each chamber. These openings will have special covers so designed as to withstand an external pressure of about 1400 lb./sq. ft. resulting from operation of the chambers under vacuum. These coverings will, however, give way very quickly when subjected to pressure from the inside. This will be accomplished by depending for strength on a frame of heavy steel plates, so placed as to offer a minimum resistance to the passage of a blast, and covering this framework on the outside with a layer of very light material of high heat insulating quality, the latter being so connected to the plates as to be easily blown off by the inside pressure.

Short wide passages formed by heavily reinforced concrete walls connect the safety openings in the chambers directly with the outside of the laboratory building so that in case of an explosion, the escaping gases and debris cannot reach the personnel.

This plan of protection was tried on small scale models before being incorporated in the design, and is expected to prevent serious damage to the chamber, while offering almost complete protection to the personnel.

Government Bids and Orders

P.O.D. Dope, Bids—Bids received July 18 at the Post Office Department, Washington, for dope:

Item 1, 2,300 gal. clear nitrate dope; 2, 500 gal. thinner; 3, 800 gal. aluminum nitrate dope; 4, 100 gal. dope thinner.

Titanine, Inc., Union, N. Y., item 1, $1.25; 2, $1.11; 3, $2.34; 4, $1.71; 2 per cent 10 days, 1 per cent 20 days, net 30 days, delivery 7 days; alt. bid, item 1, $1.50; 2, $1.11; 3, $2.34; 4, $1.71.

E. I. du Pont de Nemours & Co., Parlin, N. J., item, $1.49; 2, $1.04; 10 days.

Naval Aviation, S. and A. Bid—Sched. 2507, Philadelphia, 2,800 aircraft steel shackles, opening of Aug. 12.

S. and A. Schedules, Bids and Awards—The following bids were received and awards made by the bureau of supplies and accounts, Navy Department, for supplies under special schedules prefixed 900:

900-8599, Propeller Blades: Curtiss Aeroplane & Motor Co., Garden City, N. Y., alts., $850 and $1,200. Hamilton Aero Mfg. Co., Milwaukee, $1,950; Standard Steel Propeller Co., Pittsburgh, $1,000.

Opening of July 2, 900-8536, Hamilton Aero Mfg. Co., Milwaukee, Wis., aircraft propellers, $173 ea, total $1,750.

S. and A. Opening Aug. 5, Bids—Bids were received at the bureau of supplies and accounts, Navy Department, Washington, Aug. 5, as follows.

Schedule 2447, Aeronautics. Class 392, Philadelphia—50,000 ft. steel aircraft cable—Bid 6, $19.69; 30 days. Bid 8, $.017; 30 days. Bid 114, 2.125c. Bid 124, $1.73.

Schedule 2451, Aeronautics, Class 396, Philadelphia—150 plates casters—Bid 29, $7.30; 30 days. Bid 43, $5; 30 days. Bid 72, $5.42; 30 days. Bid 103, $5.25. Bid 152, $8. Bid 200, $5.50; 30 days.

Class 397, Philadelphia—200 caster truck wheels—Bid 29, $4.05; 30 days. Bid 43, $4.75; 30 days. Bid 72, $5.89; 30 days. Bid 103, $5.50. Bid 152, $4.50. Bid 200, $3.90; 30 days.

Schedule 2466, Aeronautics, Class 460, Philadelphia—Air speed motors—Bid 73, item 1, $34.90; 2, $33.15; 3, $30.95; 4, $27.95. Bid 144, item 1, $64.50; 2, $46.75; 3, $40.85; 4, $37.90; 120 days.

Schedule 2467, Aeronautics, Class 461, Lakehurst—1 valve-reseating machine—Bid 50, $950; 15 days. Bid 52, $950; 10 days. Bid 107, $950; 10 days. Bid 115, $950; shpt 5 days. Bid 139, $950; 5 days. Bid 161, $950; 5 days. Bid 173, $950; 30 days. Bid 180, $950; shpt 5 days.

Schedule 2469, Aeronautics, Class 465, Fort Worth—2 generators with individual switchboards—Bid 5, $3,175; 90 days. Bid 58, $3,350; 75 days. Bid 65, $3,550; 126 days. Bid 76, $2,650; 125 days. Bid 100, $2,526; 85 days. Bid 148, $2,192; 90 days. Bid 188, $3,111.

Schedule 2471, Aeronautics, Class 467, Fort Worth—2 induction motors and 2 starting compensators—Bid 5, item 1, $596; 2, $174; total, $1,540; 21 days. Bid 33, item 1, $529; 2, $154; total, $1,366; 21 days. Bid 51, item 1, $622.50; 2, $177; total, $1,599; 60 days. Bid 65, item 1, $263; 2, $195; total, $1,636; 75 days. Bid 70, item 1, $585.33; 2, $154.44; total, $1,479.54; 45 days. Bid 76, item 1, $594; 2, $118; total, $1,424; 75 days. Bid 100, $585; 2, $162; total, $1,494; 45 days. Bid 150, $706.50; 80 days. Bid 188, item 1, $569.53; 2, $152.31; total, $1,443.68; shpt 75 days. Bids 207 and 215, informal.

Army Air Service No. 6, Bids—The following bids were received Aug. 4, under cir. QR-6, by the chief of air service, U. S. Army, Washington, for 500 gal. airship rubber cement:

U. S. Rubber Co., 1790 Broadway, New York city, $1.10; Goodyear Tire & Rubber Co., Akron, Ohio, 73c; B. F. Goodrich Rubber Co., Akron, Ohio, 68c.

The office of the chief of air service, U. S. army, Washington, opened bids Aug. 18, cir. CAS 5, for 100 propeller retaining nut wrenches and 100 propeller hub lock wrenches.

Army Air Service Bids—McCook Field, Dayton, Ohio, opened bids Aug. 15, cir. 5, for 100 sets engine parts for model E and I Wright engines.

The office of the chief of air service, Washington, opened bids Aug. 19, cir. CAS-8, for 22 truss fillers, Mark T-12, for hangars 110-ft. wide and under alternate bids 110 do.

The office of chief of air service, U. S. Army, Washington, opened bids Aug. 18, cir. QR-9, for 2,000 fuel system tube assemblies.

Flame Speed and Spark Intensity

N.A.C.A. Report No. 187

This report, by D. W. Randolph and F. B. Silsbee, describes a series of experiments performed at the Bureau of Standards under the auspices of the National Advisory Committee for Aeronautics. These experiments were undertaken to determine whether or not the electrical characteristics of the igniting spark have any effect on the rapidity of flame spread in the explosive gas mixtures which it ignites. The results show very clearly that no such effect exists. The flame velocity in carbon-monoxide-oxygen, acetylene oxygen, and gasoline-air mixtures was found to be unaffected by changes in spark intensity from sparks which were barely able to ignite the mixture up to intense condenser discharge sparks having 50 times this energy.

Supply Company Incorporates

The Boren Airplane Co. of San Antonio, Tex., recently incorporated to engage in the business of aviation supplies. P. G. Boren of San Antonio heads the new company.

National Air Policy Suggestions

C. M. Keys, President of the Curtiss Aeroplane & Motor Corporation, makes the following comments on the Suggested National Air Policy:

"The suggestion for a National Air Policy, which you have been promulgating in your magazine, is broad enough to cover everything desirable; and I do not believe that any of the items in the policy, if put into effect, would fail to strengthen the general situation.

"Some of the items I do not exactly understand. Does the third item in the Governmental section mean that you advocate standing committees of the House and Senate which would at all times receive opinions from civilian and government officials with regard to aircraft policies? If so, it would constitute a curious innovation and I do not see just what would be accomplished by it. Would it not become a sort of forensic forum in which only critics would find it worth their while to appear, and would it not in time become so large a national scold that everybody would grow tired of it?

"Personally, I doubt the wisdom of the fourth item in your industrial section. I do not like too great a degree of specialization and doubt that it would work out very well except at times when, through a national emergency in some other cause, production is very heavy. Specialization up to a certain point, is naturally flowing out of the genius of particular engineers, etc., but I do not think that specialization conducted and controlled would work particularly well."

Archibald Black, the well known aeronautical engineer, brings to the discussion the subject of subsidy. He writes:

"I think that your outline of a National Air Policy is constructive and covers the ground quite well. Of course, any outline of this kind which goes somewhat into detail is bound to run counter to pet theories here and there but, on the whole, it should meet with general agreement.

"The only outstanding thoughts which I seem to have on your presentation are on the questions of government subsidies and commercial development.

"Personally I do not favor a direct government subsidy. I think that greater good can be accomplished, and with less risk of popular criticism, by a policy of encouragement rather than subsidy. Such a policy would follow the well established precedent of the Bureau of Navigation of the Department of Commerce and the other branches of the Government having contact with shipping. This policy might include the provision of landing facilities, aids to aerial navigation, meteorological information, helpful regulation of civil flying and the awarding of mail carrying contracts at appropriate rates. If we are to adopt the subsidy policy, I certainly think that it would be advisable to have the subsidies take the form of contracts for the carrying of mails at liberal rates. The government would thus be placed in the position of obtaining some return for its outlay in addition to the mere knowledge that an air fleet was being created.

"It seems to me that adequate federal legislation should form the keystone of a policy of this kind and that all interested should continue to press Congress for action on this question."

International (?) Air Races

A well informed correspondent in Paris writes as follows concerning the possibilities of French entries in the Pulitzer race in October at Dayton:

"The situation as near as I can get at it is this: Sadi Lecointe, as you know, is under annual retainer to the Nieuport Co. He is their star pilot and only flies for them. If this firm decides to send a plane to the Pulitzer meeting then Sadi Lecointe will go. Otherwise, as far as I can learn, there is no chance of his going. I am told this on the best of authority.

"Sadi Lecointe himself, I know, would like to go very much. So several of his friends have told me. I also learn this from the Aero Club. He himself also, whenever I have talked with him, has always told me so. He is, however, very noncommittal as to whether he is going or not.

"I saw him about ten days ago at the dinner of the Aero Club given to the F.A.I. delegates. I asked him if he was going to the 'States' and told him that he could be assured of a very warm welcome there. He only smiled and said that it had not been decided yet.

"There are four concerns that may possibly send an entry to the Pulitzer meeting if, after the speed trials are made, the results are satisfactory. These are the Nieuport-Astra Co., Dewoitine, Salmson-Bechereau and Ferbois.

"There is going to be a series of trials here I am told between July 15 and Aug. 1, to determine the speeds of the various pursuit planes, (avions de chasse). If the Nieuport or any of the others develop a speed sufficient to equal or surpass that made at the Pulitzer last year then, I am told, they may be entered for that meeting. If not there will be nothing done.

"I am further told that the Nieuport Co. is now making some modifications to the plane that was entered in the Beaumont Cup; that these changes are the result of the experience gained in that race. If these races turn out to give sufficient speed to beat the present American record then the plane may go to the "States." Otherwise not.

"Regarding the possible Dewoitine entry. Dewoitine has certainly turned out a very fine pursuit plane this year. I have seen it fly a couple of times at Villacoublay. It is very fast, maneuvers perfectly and is, I am told, the best avion de chasse of this year."

American World Flight

Lieuts. Lowell H. Smith and Erik Nelson, who arrived at Ivigtut, Greenland, on Aug. 24 spent several days changing their motors. They had only flown some 2,200 mi. since leaving England where the last change took place and though this is only about one third the normal mileage obtainable between overhauls of Liberty motors the fliers had had difficulty on several occasions "unsticking" from the water which puts an excessive strain on the motors and the fliers were taking no unnecessary chances.

Further details of the flight from Iceland to Greenland give a vivid picture of the difficulties which arose when the fliers crossed the ice barrier which surrounds the coast of Greenland. Due to fog the fliers were forced to fly very low and at frequent intervals they encountered great icebergs. It was in dodging one of these that Smith and Nelson became separated. The Pioneer Earth Inductor compasses have been a most valuable aid in the navigation of the planes, but the frequent twists and turns which were necessary during this part of the flight made the keeping of a course extremely difficult.

The planes were ready to resume their flight from Ivigtut, on Aug. 28, but it was not until Aug. 31 that the weather cleared sufficiently to allow the aviators to make the flight to Ice Tickle, Indian Harbor, Labrador. The 630 mi. flight across the Davis Straits was made in 6 hr. 30 min. with clear weather and a following wind for most of the course. Nelson had trouble with his gasoline pump, and his companion, Lieutenant Arnold, kept the motor going for four hours by the use of an emergency hand pump. The destroyers Coughlan, McFarland, Charles Ausburn and Lawrence which were patrolling the course all sighted the fliers. The cruiser Richmond, belching great quantities of black smoke, showed the fliers the harbor.

The fliers who had left the American Continent 5 months and 14 days before, were greeted on their return by a few amazed Eskimos and quite a battery of camera men and reporters.

Free Race Entries Close

Free entries for the International Air Races to be held in Dayton, Ohio, Oct. 2, 3, 4, 1924, closed at midnight, Sept. 1. All entrants whose entry blanks and fees were received before that date will have their entry fees refunded if the entrant is in his allotted place and ready to start in the race.

Entries received between Sept. 1 and Sept. 8 are subject to a 25 per cent penalty.

Entries received between Sept. 8 and Sept. 15 are subject to a 50 per cent penalty.

AIRPORTS AND AIRWAYS

Chicago News

By R. W. Schroeder

The Heath Airplane Co. is entering three ships in the On-to-Dayton Race; a Heath Favorite, which last year won third prize at St. Louis, a four-passenger Hisso-Standard and the little "Feather," which is equipped with a motorcycle engine. The "Feather" originally was to have been entered in the light plane contest, but it was believed that a better showing could be made with it in the On-to-Dayton Race. The seating arrangement of the Hisso-Standard is similar to that of the Lincoln-Standard 5.

* * *

Roy Ahren has set up his rebuilt "Yellow Jennie."

* * *

Sunday was a busy day at all the fields. Both the Heath ships were flying all afternoon. Gus Palmquist flew around over the North Shore auto races advertising the Zepp Motor Co., Ford dealers.

At Stanley Wallace's field a great crowd gathered to win some of the free airplane rides that were being offered with each box of candy raffled off at the field.

Walter Meyer came over in the afternoon in the Heath Favorite and did some exhibition flying.

* * *

Ed LaParle had a peculiar experience when he flew at a new field on River Road a short ways from Wallace's field. The neighboring farmer did not like the idea of LaParle flying over his grounds and when everything else failed, he appeared in his back yard with a gun, ready to shoot the aerial trespasser. As business was good, LaParle could not afford to stop flying, so he flivvered down to the Maywood constable and had the irate farmer put in the hoose-gow. The change of atmosphere quieted the country gentlemen's nerves, and he consented to let LaParle continue flying through his private air.

* * *

LaParle expects to fly to Milwaukee to take a position as pilot on an HS2L boat. He will remain away two weeks, making numerous summer resorts along the Michigan shore.

* * *

Earl T. Oakes has soloed his Jennie.

* * *

Ed LaParle and Oakes brought their Jennie back to Stanley Wallace's field for the week end. On Saturday night (Aug. 9) while Oakes was asleep in the barn at the field and LaParle was otherwise engaged outside, the hay became ignited and in a moment the old barn was enveloped in flames. Oakes was overcome by smoke and was unconscious for over an hour. In the meantime Wallace and Max Sisson fought the fire.

The next morning (Sunday) the fire was out and so was Max. He was unable to fly the ship that day and Ed La Parle piloted the Standard, carrying over 30 passengers during the afternoon.

The Ford Airport near Detroit

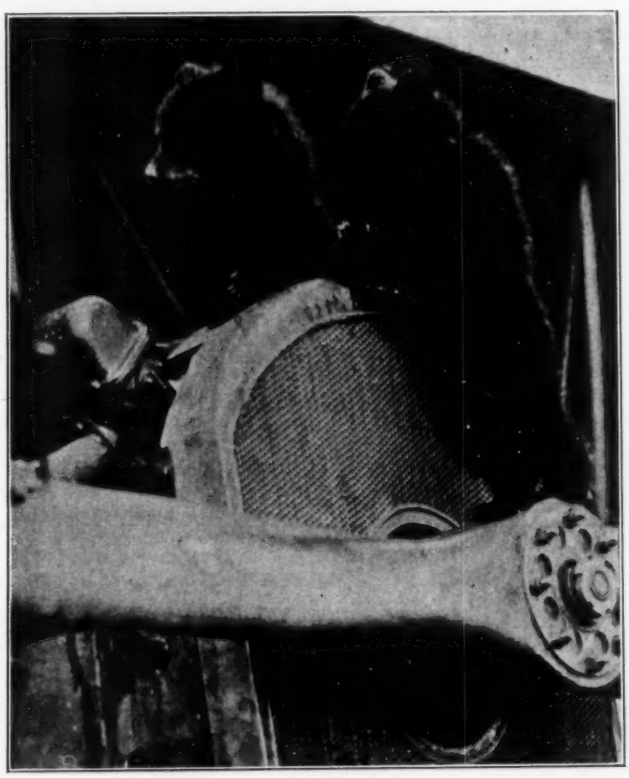
Edsel Ford has just announced the establishment of a landing field at Dearborn, to be known as the "Ford Airport" which will be ready for use within 60 days. Numberless tractors are now crawling over the land getting the surface ready, pulling out the trees, putting in drains and grading cindered runways to make this the ideal airport of America. On the edge of the field, which is on Oakwood Boulevard, just adjoining the new Ford administration building, a factory is going up for the building of Wm. B. Stout's all-metal planes and the parts for Ralph Upson's big metal dirigible which will be completed next summer.

The announcement of this field is the greatest aviation news as related to Detroit's future in the air that has come for many a day. The airport is being established as a civic necessity, and in the interest of bringing the new metal aircraft industry to Detroit, as well as in recognition of the work that has been accomplished already toward the building of lighter and heavier-than-air craft in Detroit.

A Far Flung Aviation Outpost

Fairbanks, Alaska, is represented on the American commercial flying map by the Alaska Aerial Transportation Co., of which J. S. Rodebaugh of that city is manager. The company conducts a general aviation business similar to many others in the United States. Y. B. Yunker is chief mechanic, A. M. Sampson, chief pilot and Noel Wein, pilot.

The accompanying picture of the bear cubs examining the radiator of one of the company's Standards, clearly indicates the great civilizing force of the airplane in wild regions.



"Where do we go from here?" Bear cubs inspecting one of the Standards operated by the Alaska Aerial Transportation Co. of Fairbanks

Iola, Kans., News

By Paul Neff

B. T. Barber has the motor out of his Laird cleaning it up for a trip to Chattanooga, Tenn., next month.

* * *

Harry Crewdson has taken down his Hiso motor to grind the valves and install an oil radiator.

* * *

Royal Geery is covering his SS3 and will have it in the air in the next few days.

Dick Allen has been putting on stunts at the Chanute Fair with a five passenger standard.

* * *

O. W. Haynes and William Gracie, flying a DH4B, landed here to fuel "man and beast" on their way to Richards Field at Kansas City.

* * *

Garnett, Kans. staged a flying circus on Aug. 24 before a large crowd. Clarence Clark did the stunts and Henry King furnished the wing walking and parachute jump. Passenger hauling was good at $3.00 per passenger.

* * *

Phil Wachtell returned to Lincoln, Neb., to take command of his LS5. He was held up a week on repairs after a slight crack-up at Pawnee, Neb.

* * *

Paul Neff has bought a Belt-built single-seater light plane made at Fredonia, Kans.

Boston Airport News

By G. W. Hamblin, Jr.

Sunday, Aug. 10 two Martin Bombers dropped in from Langley Field, Va. These ships brought the landing gear for the "Boston II," and three mechanics, who are to remain at the field and help equip the World Cruisers with wheels. The Bombers left Thursday morning for Langley.

* * *

Lieut. R. C. Moffat, former commandant of the Airport, flew in Monday afternoon, Aug. 11, in a Curtiss PW8. He flew from Detroit to Boston in 5 hr. flat, with one stop at Ithaca, N. Y., for fuel. He will be at the Airport on temporary duty for a couple of weeks.

* * *

Five additional mechanics are on the field, caring for the ships. They will also assist the personnel with the task of changing the Douglas Cruisers from pontoons to wheels.

* * *

The undercarriage for the World Fliers arrived a couple of weeks ago, and are now ready for the planes.

* * *

Lieut. R. J. Brown, chairman of the World Flight Committee, and now stationed at the Port, hopped down the coast to Mitchel Field, N. Y., during the week, and returned Friday afternoon.

* * *

Capt. St. Claire Streett, aide to Maj. General Patrick, came in Tuesday afternoon in a driving rain storm from Bolling Field, Washington, D. C. Capt. Burdett Wright landed from New York Wednesday morning, and both men hopped off Wednesday afternoon for Mitchel Field.

Captain Streett came up to make final arrangement for the World Fliers.

* * *

Lieut. John A. Macready of trans-continental nonstop fame, arrived Thursday, Aug. 14, in a new DH for the Airport, to replace the one that was cracked up some weeks ago.
He was, as may be expected, royally welcomed by the "gang" on the field.

* * *

Radiofans in and around Boston listened to another aviation talk, given by G. W. Hamblin, Jr., on Wednesday evening, Aug. 13, the topic of which was: "The Mail Must Fly."

* * *

Lieut. Mark C. Hogue, who flew at Saugus in 1921, flew in Tuesday, Aug. 19, in a Canuck. He was on his way to Bar Harbor, Me.

Bryan, Ohio, Secures Old Air Mail Field

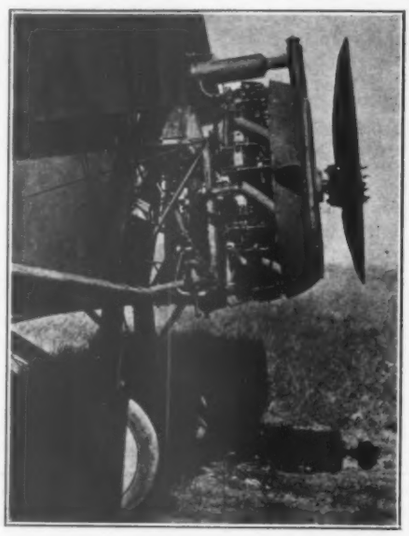
The old Air Mail Field at Bryan, Ohio, is to become a commercial aviation field as a result of an agreement between the directors of the Bryan Businessmen's Association and the Wallace-Woodson Engineering Co.

Franklin L. Wallace is manager of the company and has associated with him O. L. Woodson formerly manager of the mail field. They expect to design and build commercial aircraft and have started work on a five passenger cabin job, with high lift wings and equipped with a 270 hp. Salmson water-cooled radial motor.

A large concrete hangar located on the southwest corner of the field will be used as a factory, and also to service visiting ships. Due to the nearness of the field to Bryan and the good shop facilities it is hoped that many aerial tourists will make use of the field.

Air Mail Figures in Capture

The Air Mail's value in police work was proved on Aug. 6 when Capt. Frank Brex, chief of Newark detectives, received a telegram notifying him that the police of St. Louis, Mo., had arrested James H. Brown, a negro, of 91 William Street, Newark, on a warrant charging highway robbery.



Standard V1 with Z9 Salmson 260 hp. engine installed by W. H. Pennington of Houston, Texas

The payroll hold-up occurred on July 29. Newark detectives traced Brown to Asbury Park and Atlantic City and thence to Philadelphia, where they learned that he had boarded a train for St. Louis. They immediately dispatched the warrant, together with a photograph and description of Brown to St. Louis from Philadelphia by Air Mail from New York to Chicago. The documents reached St. Louis before Brown's train and Brown was arrested on his arrival.

Good Record of Mexican Air Transport Co.

Joe Glas, a pilot of the Compania Mexicana de Transportacion Aerea operating from Tampico, Mex., reports that his company has flown a total of 300,000 mi. during the last two and a half years without a serious accident of any kind.

The work covers distribution of payrolls for oil companies to their camps and terminals in the fields, which on account of poor transportation, impassable roads during the rainy season and ruthless banditry, can not be reached in any other manner. The company also operates aerial taxi and photographic services and carries mail. Hispano motors have been used with good success in spite of motor temperatures up to 190 to 205 deg. due to the warm climate. One model E, old type Hisso, is credited by Mr. Glass with a life of 570 hr.

The Airplane in Industry

"How the Airplane Can Be Used in Industry," by Samuel M. Felton, president of the Chicago Great Western Railroad, is the leading feature article in the August number of the *Central Manufacturing District Magazine* of Chicago. Mr. Felton has made a close study of aviation development and believes that the airplane will be used more and more for business purposes, but will not rival the railroads.

Nicholas Buys 126 OX5's

During a recent visit to New York, Russell Nicholas, of the Nicholas Aerial Shows, Marshall, Mo., purchased from the Curtiss Aeroplane & Motor Corp., 126 unusued OX5 engines. These are understood to have been the last lot of unused OX5's in the hands of the Curtiss Company.

Besides featuring day and night aerial exhibitions, the Nicholas organization has been handling a prosperous supply business.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

U. S. Army Air Service

Spec. Orders April 26 amended to direct First Lt. Burdette S. Wright, A.S., to report to Com. Of. Bolling Field until completion of Round World Flight.

First Lt. Isaiah Davies, A.S., Langley Field, upon completion of temp. duty Mitchel Field, to Org. Res. Corps. Area as Exec. Off. 8th Atteh. Wing, Richards Field. Lieutenant Davies' name placed on detached off. list effective upon reporting Richards Field.

First Lt. Corliss C. Moseley, A.S., Org. Res. 9th Corps Area, Los Angeles, to 9th Corps Area, San Francisco for temp. duty under instruction, thence to Los Angeles as instructor A. S. Cal. Nat. Guard.

Each of the following named officers, A.S. Kelly Field, upon completion of flying training Adv. Fly. Sch., to station specified: Sec. Lt. Milton J. Smith, duty with 12th Squad., Fort Bliss; Sec. Lt. Glen T. Lampton, duty with Det. 22d Obs. Squad., Fort Bragg; Sec. Lt. Charles G. Pearcy, Post Field.

Capt. Edward Winter Killgore, A.S., Off. Res. Corps, to active duty effective Aug. 15, reporting to Com. Off. Boston Airpt., and reverting to inactive status Aug. 29.

Capt. Leo A. Walton, A.S., in addition to other duties, designated Asst. Com. A. S. Eng. Sch., McCook Field.

Maj. Alfred H. Hobley, A.S., relieved from duties as Asst. Com. A. S. Eng. Sch., McCook Field.

Capt. Garth Bly Haddock, A.S., transferred to Field Art., relieved from duty Scott Field and assigned to 18th Field Art., Fort Sill.

First Lt. Timothy Kauffman, A.S., Off. Res. Corps, ordered to active duty from Washington to Hampton and reverting to inactive status July 26.

Capt. Hawthorne C. Gray, A.S., Balloon & Airship Sch., Scott Field, to duty with Com. Off. Scott Field.

Capt. Edmund W. Hill, A.S., Balloon & Airship Sch., Scott Field, to duty with Com. Off. Scott Field.

Sec. Lt. Haynie McCormick, Balloon & Airship Sch., Scott Field to duty with Com. Off. Scott Field.

Sec. Lt. George H. Steel, Field Art. detailed A.S. and will proceed from Evansville, to A. S. Prim. Fly. Sch., Brooks Field.

Sec. Lt. Louis M. Merrick, A.S., Brooks Field, to New York City, sailing on transport Nov. 26 for Panama.

Sec. Lt. Robert W. C. Wimsatt, A.S., Brooks Field, to New York City, sailing on transport Nov. 26 for Panama.

Orders July 25 amended to direct Sec. Lt. Herbert Theodore Schaefer, A.S., to proceed from Storm Lake, Iowa, to Brooks Field.

Practical Training for Reserve Officers

For perhaps the first time in the history of the United States Air Service a summer training camp carried on practical military training for the air reserves without the burden of red-tape and excessive military discipline.

This unique training course was inaugurated by the commanding officer of Ross Field near Los Angeles, Calif. More than one hundred officers were given intensive training on all ground courses. The usual routine of camp was relieved by a series of lectures on ballooning, aerial photography, principles of observations, radio communication, aerodynamics and aerostatics, the use of pigeons, meteorology, navigation, instruments, with outlines of motors, airships and the tactical use of aircraft generally. A standard hydrogen gas balloon was laid out, filled, manned and navigated by the student officers.

Southern California has more than one thousand officers who have seen war work and have participated at one time or another in aeronautic training and this course is destined to be the beginning of a regular summer school for practical refreshing of their previous training.

The roster of Ross Field's summer camp includes all ranks and branches of the service and the spirit of the camp was of such a helpful character that the most peaceful pacifist would not only have been made welcome, but would have fitted in with the program. And far-seeing officers of the Army realize that Americans are not only tired of war, but are weary and unresponsive to anything pertaining to the military spirit. If there are those who forget this, they are destined to be bumped.

Major Arnold's Fast Flight

Flying from Rockwell Field, San Diego, Calif., to San Francisco, Calif., to greet Gen. Wm. Mitchell, Maj. H. H. Arnold, on July 6, broke all speed records for the trip between these two points. With Capt. W. G. Christie, Royal Air Force, as passenger, Major Arnold took off at 10:50 a. m. and landed at Crissy Field, San Francisco, at 3:15 p. m., completing the trip in 4 hr. 25 min.

While in San Francisco Major Arnold conferred with General Mitchell, who had just returned to the United States from a three months' tour of the Philippine Islands, India and China. General Mitchell told Major Arnold that he met the American round-the-world fliers in Japan and personally congratulated them on their successful passage across the Pacific.

Major Arnold left San Francisco shortly before noon the following day and reached Rockwell Field late in the afternoon, after bucking south winds most of the way. The Major's speedy trip to San Francisco gives the big plane he used another mark. It already holds the world's record for endurance and distance marks made with Lieuts. Lowell H. Smith and John P. Richter in the control seats.

Planes Repel Tank Attack

Amid the bursting of aerial bombs, the roar of one pounders and the rattle of machine guns, the 27th Division Air Squadron, N.G.N.Y., commanded by Maj. George A. Vaughan, demonstrated on Aug. 7, at Miller Field, S. I., the value of airplanes in repulsing attacks by tanks. The problem was worked out as part of the summer training of the air squadron and the 1st Division Tank Company.

Several hostile machine-gun nests, concealed near the old Vanderbilt mansion, formed the objective of the five attacking tanks, which were commanded by Capt. C. A. Osborn. A five-plane reconnaisance formation assisted the defending forces.

Maj. Gen. Robert Lee Bullard, accompanied by Major Haskell and Maj. William L. Hensley, jr., expressed himself as highly pleased with the maneuvering of the National Guard aviators and the tactics of the tanks.

Airplane Pilots—Attention!

Army Airplane pilots who desire to become Airship Pilots are informed that the Chief of Air Service will approve a limited number of applications to enter with the next class at Scott Field, which will commence about Sept. 15, 1924, and end about June 20, 1925.

The usual exemptions in the ground course are permitted where students show satisfactory knowledge of a subject.

Applications should be made at once to the Chief of Air Service through proper channels. In forwarding applications for this training, Commanding Officers will state:

(a) Whether approval or disapproval is recommended; (b) If disapproved, reason therefor; (c) What, if any, duty the officer may be performing for which no suitable replacement is on duty at station; (d) Length of time at present station.

U. S. NAVAL AVIATION

Navy Completes Air Map of Oil Reserves

Aerial photographic mapping of the Naval Oil Reserves has been completed by planes from the Naval Air Station, San Diego, Calif.

Three Navy planes have been engaged in the work which is designed to aid in the study of problems relating to oil conservation for Naval purposes. In order to get a comprehensive aerial map of the oil reserves the photographic planes worked at an elevation of 13,000 ft.

According to Lieut. B. H. Wyatt, who had charge of the work, difficulties were encountered in flying over San Joaquin Valley similar to those that might have been experienced in flying over a giant furnace. With temperatures on the ground ranging well over a hundred degrees the pilots experienced even more excessive temperatures at 2,000 ft. Not only the discomfort of this excessive heat was experienced but the unusual atmospheric conditions of rough and bumpy air made piloting a difficult task.

Naval Aviators

Naval regulations will shortly be amended so as to more clearly define the designations "naval aviator" and "student naval aviator." The term will really be so broadened as to more firmly establish the status of staff officers as well as line who qualify as naval aviators.

It will be set forth, however, that officers who are not eligible to command naval craft in war cannot qualify as aviators. All officers without regard to corps, whose duties involve frequent flights, will be detailed to aviation. Officers of the staff who are now qualified naval aviators will continue on this status. Staff officers will also be permitted to qualify as aviators.

Marine Aviation Detachment in Maneuvers

An aviation detachment, commanded by Capt. Warren McCaughtry, comprising three squadrons made up of fast pursuit and combat, observation and bombing planes, together with a number of Martin bombers, accompanied the Martin Expeditionary Forces on their anual maneuvers which took place in the neighborhood of Quantico, Va. during the latter part of August.

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PUBLISHER'S NEWS LETTER

James Harxness, Ex-Governor of Vermont, a pilot since 1916, expresses in *The Stevens Indicator* a truism that has a peculiar application to aircraft design and development. He says:

"A most cursory glance at the machinery in use in the world will show that the work has been done by imperfect machines. A study of the design of any machine brings out the innumerable shortcomings.

"If we see a machine that seems perfect, it is perfectly safe to set it down in black and white that we do not fully comprehend it. It is safe to say that the only perfect machine is the new model that is to be tried very soon.

"With these facts in mind it does not require very much courage to go ahead with an imperfect design, but unfortunately these thoughts will not stay in the mind of the average mortal. They are crowded out by the flood of ideas for still further betterment, and that is why it is just to give high rank to the man who had courage to go ahead and build, even when he realized the faults of a design."

How true this is when applied to airplanes, airships and aircraft engines is apparent to anyone who has observed the trend of aeronautical development.

Inventors are considered poor business men for the reasons so cogently stated by Gov. Harxness. The military and naval aircraft designers can find much wisdom if they give some thought to this statement. The innumerable changes in types and alterations of design have been perhaps responsible for part of the criticism that has been made regarding aircraft costs. It takes a brave engineer to make a final decision and await results before making "changes."

* * * *

The Commercial Aircraft Association of Akron has been progressing slowly but along correct lines. The principles of the Association indicate such a breadth of view that they can quite properly be considered in connection with the Suggested National Air Policy.

* * * *

Interpretation of the Principles on Which the By-Laws Are Based

1. *The Building Up of Commercial Aeronautics.* The foundation of which is public confidence, which springs from integrity, fair dealing, efficient service, and mutual benefit.

2. *The Individual Reward of Commercial Aeronautics.* The reward for services rendered is a fair profit plus a safe reserve, commensurate with risks involved and foresight exercised.

3. *The Successful Operation of Commercial Aeronautics.* The successful operation depends upon the just and equal consideration of capital, management, employees, and the public.

4. *The Future of Individuals in Commercial Aeronautics.* Knowledge—thorough and specific—and unceasing study of the facts and forces affecting commercial aeronautics are essential to a lasting individual success.

5. *The Obligations of Individuals Interested in Commercial Aeronautics.* Obligations to the public prompt individuals unceasingly to strive toward permanency and continuity of operation of commercial aeronautics. That knowledge gained may be fully utilized, confidence established, conditions of employment bettered, efficiency and opportunities of individual employees increased.

6. *Contracts and Undertakings in Commercial Aeronautics.* Contracts and undertakings, written or oral, are to be performed in letter and spirit. Changed conditions do not justify their cancellation without mutual consent.

7. *The Representation of Goods and Services in Commercial Aeronautics.* The representation of goods and services should be truthfully made and scrupulously fulfilled.

8. *Waste in Any Form in Commercial Aeronautics*—of capital, labor, services, or material—is intolerable, and effort shall be made towards its elimination.

9. *Excesses of Every Nature in Commercial Aeronautics*—inflation of credit, over-buying, over-expansion, over-stimulation of sales—which create artificial conditions and produce crises and depressions in the individual's financial condition, are condemned.

10. *Unfair Competition in Commercial Aeronautics*, embracing all acts characterized by bad faith, deception, fraud, or oppression, including commercial bribery, is wasteful, despicable and a public wrong. The members of the Commercial Aircraft Association will rely for their success on the excellency of their own service.

11. *Controversies in Commercial Aeronautics* will, where possible, be adjusted by voluntary agreement or impartial arbitration by the association.

12. *Corporate Forms in Commercial Aeronautics* do not absolve from or alter the moral obligation of the individual.

13. *Lawful Co-operation* among business men and in useful business organizations in support of the principles of the Commercial Aircraft Association is commended.

14. *Commercial Aeronautics* should render restrictive legislation unnecessary through so conducting itself as to deserve and inspire public confidence in its ability to operate under constructive legislation.—L.D.G.

A Suggested National Air Policy

That a National Aviation Policy is needed by the United States is obvious. To get such a policy in concrete form AVIATION *requested several thoughtful friends of aeronautical progress to make suggestive and constructive recommendations. Some of them are given below and will be printed each week with additions, omissions and such other changes as appear to be helpful toward the formulation of a sound national air policy. Readers of* AVIATION *and others can render no greater service to the cause of aeronautical progress than contributing their comments and suggestions.*

GOVERNMENTAL.

A continuing program of aircraft development both governmental and commercial.
A civilian, charged with championing a national air policy, is needed in the Government. **Cabinet*
Aircraft committees in the House and Senate to hold aircraft hearings where civilians as well as government officials can express their opinions. **composed of fliers.*
A detailed aircraft budget for all Governmental Departments, and an annual statement of all expenditures.
An experienced staff of flying officers at the head of all governmental air defense services.
Coordination of all procurement and experimental aircraft work of the government under one agency.
**Co-ordination of the aircraft experimental development of the government leaving procurement to the various branches themselves.*
Limitation of government manufacture to repair of aircraft and specialized work that cannot be done by private firms. **No limitation on experimental construction.*
The elimination of the duplication of aerial functions and facilities by government departments.
A country wide Air Mail system of trunk lines connecting the principal cities of the country. **Retirement law for air mail pilots.*
Establishment of a National Airway System through cooperation of the Federal Government with States and Cities. **A landing field in every large city.*
A national aircraft law that will regulate aviation, administered by practical pilots and experienced aeronautical engineers. **and federal air police.*
Membership of the United States in the International Convention for Air Navigation.
**Increased governmental appropriations for aerial development.*
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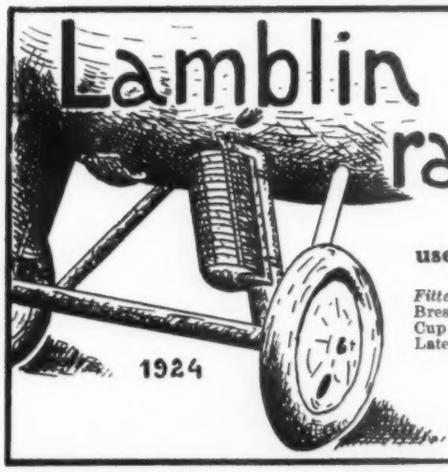

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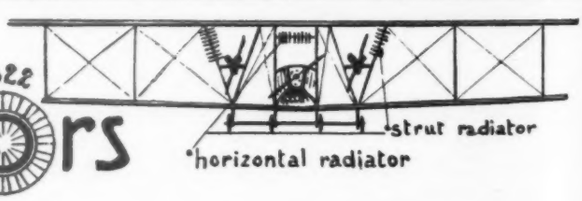

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170	Copper tubing 1/8" 16 ft. lengths per foot	.15
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2615	Compass General Electric vertical Army type	10.00
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2657	Tachometer Van Sicklen luminus dial 0 to 2500 RPM	10.00

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Extreme maneuverability with comfort and visibility to the pilot at all times;

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